

II. Remarks In Response to the Office Action

A. General Remarks

Claims 1-4, 6-19, 21-34, and 36-45 were pending in the application prior to this Reply. Claims 7, 11, 22, 26, 37, and 41 have been cancelled without prejudice to pursuing them in a continuing application. Therefore, claim 1-4, 6, 8-10, 12-19, 21, 23-25, 27-34, 36, 38-40, and 42-45 are pending.

In responding to the Examiner's prior art rejections, Assignee here only justify the patentability of the independent claims (*i.e.*, claims 1, 16, and 31). As the Examiner will appreciate, should these independent claims be patentable over the prior art, narrower dependent claims would also necessarily be patentable. Accordingly, Assignee does not separately discuss the patentability of the dependent claims, although Assignee reserves the right to do so at a later time if necessary.

B. Claim Rejections - 35 USC § 101

Claims 1, 16, and 31 stand rejected under 35 U.S.C. § 101 for being directed to non-statutory subject matter.

In response, Assignee has clarified the claimed invention in claims 1, 16, and 31, even though these clarifications inherently flowed from the previously presented claims. In clarifying the claims, Assignee has rearranged the claimed elements related to collecting statistics and determining characteristics and has interrelated them explicitly to the claimed element of determining actions. These clarifications alleviate the Examiner's concern that "the claims fail to produce a tangible result because of the outcome of 'determining' is never stored or presented." Office Action at ¶ 4, page 2. With these clarifications, the Examiner will note that the "determining" characteristics is not the "outcome" of the claimed invention. Rather, the Examiner will note that the claimed invention produces a useful, concrete, and tangible result by modifying database objects and reconfiguring the criteria used to manage those database objects. These are reproducible, real world results that have a practical application in database management. Accordingly, claims 1, 16, and 31 and those depending therefrom comply with 35

U.S.C. § 101, and Assignee respectfully requests that the rejection be reconsidered and withdrawn.

C. Claim Rejections - 35 USC § 102

Claims 1, 4, 6-16, 19, 21-31, and 36-45 stand rejected under 35 U.S.C. 102(e) as being anticipated by Chaudhuri (US 6,223,171).

Assignee respectfully traverses the contention that Chaudhuri anticipates claims 1, 4, 6-16, 19, 21-31, and 36-45 insofar as Chaudhuri does not teach or suggest each claimed element called for in independent claims 1, 16, and 31.

1. Legal Principles

“For a prior art reference to anticipate in terms of 35 U.S.C. § 102, every element of the claimed invention must be identically shown in a single reference.” *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 677, 7 U.S.P.Q.2d 1315, 1317 (Fed. Cir. 1988). Further, the “identical invention must be shown in as complete detail as is contained in the patent claim” (*Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1922 (Fed. Cir. 1989), *cert. denied*, 493 U.S. 853 (1989)), and the “elements must be arranged as in the claim under review” (*In re Bond*, 910 F.2d 831, 832 Fed. Cir. 1990), *reh’g denied*, 1990 U.S. App. LEXIS 19971 (Fed. Cir. 1990)). *See also* M.P.E.P. 2131. Therefore, for Chaudhuri to anticipate claims 1, 4, 6-16, 19, 21-31, and 36-45, Chaudhuri must disclose each element contained in the claims, and there must be no difference between the claimed invention and the disclosure of Chaudhuri.

2. Assignee’s claims

Independent claims 1, 16, and 31 are directed to automated database management. Management criteria are associated with the database to manage database objects, and statistics relating to operation of the database are collected. Based on the collected statistics, characteristics of the database objects are determined. Based on the management criteria and the determined characteristics of the database objects, actions to be performed on one or more database objects are determined to modify the one or more database objects. These determined

actions are performed on the database objects to modify them, and the results are monitored. Based on the results, the management criteria are reconfigured.

3. Disclosure of Chaudhuri

Chaudhuri discloses a What-if index analysis that analyzes the performance of an existing configuration of a database system (200) with respect to workloads of queries and that proposes a hypothetical configuration for the database system (200) to analyze its potential impact on the performance of the database system. Chaudhuri at col. 4:19-34. As disclosed, a hypothetical configuration analysis (HCA) engine (240) performs the analyses of the database system (200) (*Id.* at col. 7:30-32), and an index selection tool 230 uses the HCA engine 240 to improve performance of database system (200), for example, by modifying the set of indexes selected by a database server (220). *Id.* at col. 7:45-54.

To analyze the database system (200), a hypothetical set of indexes and a hypothetical database size for a hypothetical configuration can be defined with the HCA engine (240). *Id.* at col. 8:33-46 and 55-61. An HCA interface 260 is used to simulate the hypothetical configurations, and commands of the HCA interface 260 define workloads and hypothetical configurations and evaluate workloads for existing and hypothetical configurations. *Id.* at col. 9:23-30. If the database server (220) is an SQL Server, the SQL Server Profiler can be used to log events to create a workload as input for the hypothetical analysis. *Id.* at col. 11, lines 55-65.

4. Analysis

As discussed above, Chaudhuri is directed to running what-if analysis on a database system (200) by creating a hypothetical configuration of indexes and database size and analyzing the performance impact of the hypothetical configuration in accessing the database management system (200). Assignee has reviewed the disclosure of Chaudhuri, and Assignee fails to see how Chaudhuri's disclosure is related to Assignee's claimed invention. Fundamentally, Chaudhuri is directed to what-if, hypothetical analysis of the impact of a selected set of indexes and database size has on the performance of a database system. In contrast, Assignee's claimed invention is directed to automated database management where management criteria are associated with database objects, actions to modify the database objects are made, and the management criteria

are reconfigured based on results. Furthermore, Assignee fails to see how Chaudhuri's disclosure is capable of anticipating Assignee's claims in light of the fact that the features in Chaudhuri's disclosure are significantly different from Assignee's claims elements.

First, the Examiner contends that an index selection tool (230) used in Chaudhuri to select what set of indexes can be accessed by a database server (220) corresponds to Assignee's claimed element of associating management criteria with a database to manage database objects. Assignee fails to see what the management criteria in Chaudhuri would be that would be associated with a database to manage the objects of the database. As disclosed in Chaudhuri, the index selection tool (230) is used to select indexes and evidently does not associate management criteria with a database to manage objects of the database. Rather, the selected indexes relate to how database objects are accessed when processing queries to a database system, and Chaudhuri's disclosure uses the set of selected indexes in a hypothetical configuration to analyze their impact on performance when processing a workload of the database system (200). *See e.g.*, Chaudhuri at col. 7, lines 30-54. Selecting indexes for a hypothetical analysis of how a database system performs does not correspond to associating criteria with a database on how to manage objects of the database as used in conjunction with the other elements of Assignee's claims.

Second, the Examiner contends that using an SQL Server Profiler as disclosed in Chaudhuri corresponds to determining characteristics of database objects based on collected statistics called for in Assignee's claims. In Chaudhuri, the SQL Server Profiler apparently logs events over periods of time to determine a workload for a database system. *See* Chaudhuri at col. 11, lines 55-65. A database administrator can then use the workload from the SQL Server Profiler as input for a What-if index analysis so that the workload can be used to simulate access to the database system (200) with a hypothetical configuration of the indexes. *See* Chaudhuri at col. 11, lines 46-54. Assignee fails to see how characteristics of database objects are determined from a workload file of logged queries of a database system.

Third, the Examiner contends that defining a hypothetical database size in Chaudhuri for a hypothetical configuration corresponds to determining actions to be performed on database objects to modify the database objects based on management criteria and the determined characteristics of the database objects called for in Assignee's claims. Assignee fails to see what

actions in Chaudhuri would even be determined to modify the objects of the database. In addition, Assignee fails to see how such modifying actions would be determined based on management criteria associated with the database objects and characteristics determined from the database objects. In Chaudhuri, the hypothetical database size is used to analyze the hypothetical impact of a projected change in database size on performance in accessing the database system 200. Chaudhuri at col. 8, line 55-61. It is unclear how a projected change in size of the database (*i.e.*, a hypothetical database size) relates to an action to be performed on a database to modify the objects of the database.

Fourth, the Examiner contends that defining a set of hypothetical indexes for what-if index analysis in Chaudhuri corresponds to modifying the database objects by performing actions on the database objects called for in Assignee's claims. Assignee fails to see what actions are performed to modify objects of database in Chaudhuri. As disclosed in Chaudhuri, a hypothetical set of indexes are selected to project changes to the database system (200), and the hypothetical set of indexes are used in a hypothetical analysis of the impact on the performance of the database system (200). Chaudhuri at col. 8, lines 33-46. The hypothetical set of indexes does not modify database objects. Rather, the hypothetical set of indexes are used in hypothetical analysis. Furthermore, Chaudhuri discloses that the hypothetical set of indexes should be consistent with constraints defined by the schema of the database (210), which further indicates that actual database objects are not modified by any actions. Chaudhuri at col. 8, lines 47-49.

Fifth, the Examiner contends that defining a hypothetical database size in Chaudhuri corresponds to monitoring results of modifying the database objects called for in Assignee's claims. Assignee fails to see in Chaudhuri how database objects are modified and what results are monitored from such a modification based on a hypothetical database size. As disclosed in Chaudhuri, a hypothetical database size is used to project changes to a database and to analyze the performance impact of those projected changes in a hypothetical configuration. Chaudhuri at col. 8, line 55 to col. 9, line 8. Chaudhuri does not disclose that the hypothetical database size is actually used to modify database objects and does not disclose that any results of an actual modification of database objects in a database are monitored. Rather, the hypothetical database

size is calculated using a database scaling factor and is then used in a hypothetical analysis. *See* Chaudhuri at col. 8, line 62 to col. 9, line 8.

Finally, the Examiner contends that executing commands that can remove, delete, etc. data from an analysis table of a workload or a configuration corresponds to Assignee's claimed element of reconfiguring management criteria associated with a database based on results of modifying database objects. The commands disclosed in Chaudhuri at col. 9, line 23 to col. 11, line 41 appear to manipulate analysis data. For example, one of the commands is a Remove Cost-Usage command. When executing this command, the HCA engine (240) removes cost and index usage information for a designated workload and a designated configuration from analysis data tables. *Id.* at col. 11:31-41. Assignee fails to see (1) how the analysis table in Chaudhuri corresponds to management criteria used to manage objects of a database, (2) how executing commands to manipulate analysis data corresponds to reconfiguring criteria for managing database objects, and (3) how the commands manipulating data in an analysis table containing a workload or a configuration constitutes results of modifying database objects with determined actions. In short, Assignee fails to see how manipulating data in an analysis table would correspond to reconfiguring criteria used to manage database objects.

In summary, Chaudhuri's disclosure of performing what-if analysis on a database system using hypothetical configurations of indexes and database size to analyze the performance impact on the database system fails to teach or suggest each claimed element in as complete detail contained in Assignee's claims. For at least these reasons, Chaudhuri does not anticipate Assignee's claims, and Assignee respectfully requests allowance of all pending claims in the next paper from the Office.

D. Claim Rejections - 35 USC § 103

Claims 2, 3, 17, 18, 32, and 33 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Chaudhuri in view of Fizman (US 6,115,646). Assignee respectfully traverses the contention that the combination of Chaudhuri in view of Fizman renders claims 2, 3, 17, 18, 32, and 33 obvious insofar as the combination does not teach or suggest each claimed element called for in independent claims 1, 16, and 31. As noted above in Section C, Chaudhuri fails to teach or suggest each claimed element of independent claims 1, 16, and 31. Even if it

were appropriate to combine Chaudhuri and Fiszman, Fiszman fails to provide the claimed elements missing from Chaudhuri because Fiszman is merely directed to an automated system that controls execution of processes on nodes of a computer network having processing agents. *See* Fiszman at col. 3, lines 11-14. Accordingly, the combination of Chaudhuri and Fiszman cannot render claims 2, 3, 17, 18, 32, and 33 as obvious.

E. Fees

No fees are believed due at this time. The undersigned representative requests any extension of time that may be deemed necessary to further the prosecution of this application. Should any fees be due for any reason, the undersigned representative authorizes the Commissioner to charge any additional fees that may be required, or credit any overpayment, to Deposit Account No. 501922, referencing order no. 149-0046US.

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To facilitate the resolution of any issues or questions presented by this paper, Assignee respectfully requests that the Examiner directly contact the undersigned by phone to further the discussion, reconsideration, and allowance of the claims.

Respectfully submitted,

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